

How to Avoid Overfertilizing

Applying the Right Amount of Nutrients Without Creating New Problems



LEARNING CENTER

GROWING TIPS

How to Avoid Overfertilizing

Applying the Right Amount for
Healthy Plants, Healthy Soil,
and a Healthy Environment



**RIGHT RATE.
BETTER RESULTS.**



TEST FIRST
Use soil data to
guide the need



FOLLOW THE RATE
Apply only the
labeled amount



TIME IT RIGHT
Match timing to
plant demand



AVOID EXCESS
Reduce stress,
waste, and runoff

Fertilizer is intended to support plant growth.

More fertilizer, however, does not automatically produce healthier plants.

When nutrients are applied beyond what the crop or soil can effectively use, the result can be wasted fertilizer, nutrient imbalances, excessive salts, plant injury, unnecessary vegetative growth, or nutrient movement beyond the root zone.

Good fertilizer management is therefore not about applying the maximum amount possible.

It is about supplying the nutrients plants need at the appropriate rate, time, and location.

USDA Natural Resources Conservation Service nutrient-management guidance emphasizes applying the right nutrient source at the right rate, at the right time, and in the right place. Applying nutrients at the correct rate helps meet crop needs while limiting excess nutrients that may be lost to the environment.

What Is Overfertilizing?

Overfertilizing occurs when more fertilizer is applied than the plant or growing system can effectively use.

This can happen through:

- Applying too much product at one time
- Fertilizing too frequently
- Using an application rate that is too high
- Applying nutrients that are already present in sufficient quantities
- Repeatedly adding nutrient-rich composts or manures
- Applying fertilizer when plants are not actively using nutrients
- Improper fertilizer placement
- Failing to account for nutrients supplied by other products or amendments

Overfertilizing is not limited to synthetic fertilizers.

Organic fertilizers, composts, manures, and other naturally derived nutrient sources can also supply nutrients in excess of plant requirements.

Start With a Soil Test

One of the most effective ways to avoid unnecessary fertilizer applications is to determine what nutrients are already present.

A soil test may provide information about:

- Soil pH
- Phosphorus
- Potassium
- Organic matter
- Soluble salts
- Other nutrients or soil characteristics

The fertilizer label tells you what is in the product.

The soil test helps tell you what may already be available in the soil.

Without that information, it is easy to continue adding nutrients that are already present at adequate or excessive levels.

University of Minnesota Extension notes that excessive applications of compost and manure can cause nutrients such as phosphorus, potassium, calcium, magnesium, and sodium to accumulate.

Follow the Label Rate

The fertilizer label provides the manufacturer's directions for proper use.

Those directions may specify:

- Application rate
- Dilution rate
- Frequency
- Placement
- Application method
- Crop or plant type

- Timing
- Irrigation requirements

Applying twice the recommended amount does not mean twice the benefit.

It may instead increase the concentration of nutrients and salts around plant roots.

Always measure concentrated fertilizers carefully rather than estimating.

Understand What the NPK Numbers Mean

The three numbers on a fertilizer label represent the guaranteed percentages of nitrogen, available phosphate, and soluble potash.

A more concentrated fertilizer delivers more nutrients per pound or gallon.

That means products with different analyses may require very different application rates.

For example, applying the same physical quantity of a higher-analysis fertilizer as a lower-analysis fertilizer can result in substantially more nutrients being delivered.

Application rate should therefore be based on nutrient requirements and product concentration, not simply on the size of the planting area or the amount of fertilizer available.

Do Not Fertilize by Habit

It is easy to develop a routine such as:

"I fertilize every two weeks."

That may or may not match the needs of the plant.

Nutrient requirements change with:

- Growth stage
- Temperature
- Soil moisture
- Season
- Crop
- Plant size

- Irrigation
- Existing soil fertility

A fertilizer schedule should be adjusted when conditions change.

If growth slows because of heat, cold, dormancy, drought, or another limitation, plants may not use nutrients at the same rate.

Fertilizing simply because the calendar says it is time can lead to unnecessary applications.

Watch for Salt Accumulation

Many fertilizers contribute soluble salts to the soil or growing media.

At appropriate levels, these nutrients support plant growth.

At excessive concentrations, however, salts can interfere with the plant's ability to take up water and may damage roots.

University of Minnesota Extension specifically warns that overapplying fertilizers can contribute to salinity problems, particularly in intensively managed growing environments.

Salt accumulation can be especially important in:

- Containers
- Greenhouses
- High tunnels
- Poorly drained soils
- Areas with limited rainfall
- Growing systems receiving frequent fertilizer applications

Testing for soluble salts can help identify whether excessive nutrient accumulation is developing.

Recognize Possible Signs of Excess Fertilizer

Symptoms vary depending on the crop, nutrient, fertilizer, and growing environment.

Possible warning signs can include:

- Browning or scorching along leaf edges
- Wilting despite adequate soil moisture
- Reduced root growth
- Stunted plants
- Poor seed germination
- Excessively lush vegetative growth
- Unusually dark green foliage
- Nutrient-deficiency symptoms caused by nutrient imbalance
- White or crusty salt deposits on soil or container surfaces

These symptoms are not unique to overfertilization.

Disease, drought, poor drainage, root damage, salinity from irrigation water, or other problems can create similar symptoms.

Diagnosis should therefore consider the entire growing system rather than assuming fertilizer is always the cause.

Too Much of One Nutrient Can Affect Another

Plant nutrition involves balance.

Excessive quantities of one nutrient can interfere with the uptake or availability of another.

University of Minnesota Extension notes that excessive concentrations of nutrients can inhibit the uptake of other nutrients and produce apparent deficiencies even when the affected nutrient is present in the soil.

This is an important reason not to respond automatically to every yellow leaf or growth problem with more fertilizer.

Adding another nutrient without understanding the underlying imbalance may make the problem worse.

Avoid Fertilizer Contact With Sensitive Roots or Seeds

Placement matters.

Concentrated fertilizer positioned directly against seeds or young roots can damage plant tissue.

University of Minnesota Extension warns that placing fertilizer directly with corn seed can reduce germination and plant growth because of fertilizer injury.

The same general principle applies elsewhere.

Young plants and newly developing roots can be particularly sensitive to excessive fertilizer concentration.

Follow label directions concerning:

- Distance from seeds
- Placement around plants
- Incorporation
- Dilution
- Watering after application

Do Not Assume Organic Means Harmless

Organic fertilizers can be valuable nutrient sources.

They can still be overapplied.

Manure, compost, fish-based fertilizers, plant meals, and other organic materials contain real nutrients.

Repeated applications can result in nutrient accumulation even when each individual application seems reasonable.

Oregon State University Extension has documented that excessive organic matter additions can contribute to fertilizer leaching, runoff, plant injury, and wasted resources.

The appropriate question is not:

Is the fertilizer organic?

The better question is:

How much nutrient is being applied, and how much does the crop actually need?

Account for Every Nutrient Source

Plants may receive nutrients from more than one source.

These can include:

- Fertilizer
- Compost
- Manure
- Irrigation water
- Previous fertilizer applications
- Soil organic matter
- Mulches
- Blended soil amendments
- Residual fertility from previous crops

If these sources are not considered together, the total amount of nutrients supplied can exceed the intended rate.

A nutrient-management program should consider the entire nutrient budget rather than evaluating each product separately.

Avoid Applying Fertilizer Before Heavy Rain

Nutrients that are not retained in the root zone may move with water.

Applying fertilizer immediately before significant rainfall can increase the potential for runoff or nutrient movement through the soil.

NRCS nutrient-management guidance emphasizes matching fertilizer timing and placement to crop needs and environmental conditions to reduce nutrient losses.

Before applying fertilizer, consider:

- Rainfall forecast
- Soil moisture
- Slope

- Drainage
- Proximity to surface water
- Irrigation schedule
- Soil texture

The goal is to keep nutrients where plants can use them.

Be Careful With Newly Established Plants

Young plants often have smaller root systems and less ability to tolerate high fertilizer concentrations.

Some crops are particularly sensitive to salt injury during establishment.

University of Minnesota Extension, for example, cautions against excessive fertilizer application in newly planted blueberries because of their susceptibility to salt damage.

New plantings should therefore be fertilized according to crop-specific recommendations rather than receiving the same rates used for mature plants.

Excess Nitrogen Can Create Too Much Growth

Nitrogen encourages vegetative growth.

When excessive nitrogen is applied, some plants may produce unusually rapid or lush shoot growth.

That can create additional management concerns, including:

- Greater water demand
- Increased pruning requirements
- Delayed maturity in some crops
- Reduced flowering or fruiting balance
- Weaker growth
- Greater susceptibility to certain stresses

Oregon State University Extension notes that overfertilization can stimulate new growth and increase water requirements in landscapes.

The goal is balanced growth, not maximum leaf production.

Split Applications May Help

In some growing systems, applying fertilizer in several smaller applications may be more appropriate than applying the entire seasonal amount at once.

Split applications can help:

- Match nutrient supply with crop demand
- Reduce high concentrations around roots
- Adjust applications as conditions change
- Reduce the amount of nutrient exposed to potential loss at one time

Whether split applications are appropriate depends on the crop, fertilizer, soil, irrigation system, and production method.

Follow crop-specific recommendations and product directions.

Calibrate Application Equipment

Overapplication sometimes happens because the fertilizer rate is correct on paper but the equipment delivers too much product.

Spreaders, injectors, fertigation equipment, pumps, and measuring systems should be calibrated so the intended rate is actually applied.

Incorrect calibration can result in:

- Uneven application
- Excessive rates
- Missed areas
- Wasted fertilizer
- Plant injury

For commercial production, accurate equipment calibration is an important part of nutrient management.

Measure the Area Correctly

Application rates are commonly based on:

- Square footage
- Acres
- Number of plants
- Gallons of solution
- Container volume
- Row length

An error in estimating the treated area can create a significant rate error.

Measure the area before calculating the amount of fertilizer needed.

Do not round upward simply to use the remainder of a bag, jug, or tank.

Unused product can be stored according to label directions for future applications.

If You Suspect Overfertilization

Do not immediately add another product to correct the problem.

First determine what happened.

Consider:

- What fertilizer was applied?
- What rate was used?
- When was it applied?
- Was the product diluted correctly?
- What nutrients were already present?
- Has compost or manure also been applied?
- What is the soil moisture condition?
- Are soluble salts elevated?
- Are symptoms consistent across the planting?

Depending on the growing system, soil testing, irrigation management, or consultation with an agronomist or Extension professional may be appropriate.

The proper corrective action depends on the specific fertilizer, soil, crop, and severity of the problem.

A Simple Overfertilization Prevention Checklist

Before applying fertilizer, ask:

- Have I tested the soil?
- Does the crop actually need additional nutrients?
- Am I using the correct product?
- Do I understand the NPK analysis?
- Have I measured the application area?
- Have I calculated the correct amount?
- Is my application equipment calibrated?
- Have I accounted for compost, manure, and previous fertilizer applications?
- Is the plant actively growing?
- Is the soil moisture appropriate?
- Is heavy rain expected?
- Is the fertilizer being placed correctly?
- Am I following the label rate?
- Am I fertilizing because the plant needs nutrients or simply because I usually fertilize now?

The Bottom Line

Fertilizer is most effective when it supplies what the plant needs without creating unnecessary excess.

Avoiding overfertilization begins with:

Testing the soil.

Understanding the fertilizer analysis.

Applying the correct rate.

Timing applications to plant demand.

Accounting for all nutrient sources.

Following the product label.

More fertilizer does not automatically mean more growth.

The objective is balanced nutrition.

Apply enough to meet the plant's needs, and no more than the growing system can effectively use.

Disclaimer: This material is provided for general educational purposes only. Growing conditions, soil characteristics, crop requirements, application rates, and regulatory requirements vary. Always follow product label directions as well as all governmental and safety regulations or recommendations, and consult appropriate agronomic, regulatory, or crop-management professionals when making site-specific fertilizer or soil-management decisions.

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